

Application No.: 09/581,878
Attorney Docket No.: FUK-71
Reply for Office Action Dated: March 11, 2004

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A semiconductor manufacturing apparatus for processing a substrate surface, said apparatus comprising:

a vacuum vessel having a vacuum vessel plate;

a substrate stage fixedly provided on said vacuum vessel plate, ~~said substrate stage thereby having a constant vertical position relative to said vacuum vessel plate~~ said substrate stage ~~having an operatively immovable substrate receiving portion;~~

a cylinder installed surrounding said substrate stage, a gap existing between said cylinder and said vacuum vessel plate, said gap being made variable by lifting/lowering said cylinder, said cylinder having a cylinder interior space and a cylinder exterior space associated therewith, said cylinder interior space defining a processing chamber for processing said substrate surface, said cylinder exterior space including a transport chamber for transferring said substrate;

at least one cylinder lifting/lowering mechanism being operatively associated with said cylinder;

a substrate conveyer mechanism provided with said transport chamber, said substrate conveyer mechanism for transferring said substrate between said processing chamber and said transport chamber through said gap;

said processing chamber being provided with a processing chamber gas inlet and a processing chamber gas outlet; and

said transport chamber being provided with a transport chamber gas inlet and a transport chamber gas outlet.

2. (Currently Amended) A semiconductor manufacturing apparatus for processing a substrate surface, the apparatus composed of a vacuum vessel with a top and bottom plate, said apparatus comprising:

a plurality of substrate stages fixedly provided on said vacuum vessel bottom plate, each of said substrate stages ~~thereby having a constant vertical position relative to said vacuum vessel plate~~ respectively having an operatively immovable substrate receiving portion;

a plurality of cylinders provided respectively with an O ring connected to said bottom plate through bellows so as to surround said substrate stage, said cylinders forming a gap with

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said vacuum vessel top plate, a gap between said cylinder and said vacuum vessel top plate being made variable by lifting/lowering said cylinder, and at a position where said gap becomes minimum, a plurality of cylinder lifting/lowering mechanisms operatively associated with said cylinder being provided, in order to hermetically separate an interior space inside said cylinder from an exterior space outside thereof, said interior space forming a processing chamber for processing said substrate surface, the exterior space defining a transport chamber for transferring said substrate;

 said transport chamber being provided with a substrate conveyer mechanism for transferring said substrate between said processing chamber and said transport chamber through said gap;

 said processing chamber being provided with a processing chamber gas inlet and a processing chamber gas outlet; and

 said transport chamber being provided with a transport chamber gas inlet and a transport chamber gas outlet.

3. (Currently Amended) The semiconductor manufacturing apparatus according to Claim 1, wherein said vacuum vessel ~~can be divided into a part including said processing chamber and a part having said substrate transport mechanism having a modular configuration, the modular configuration including a first modular unit having said processing chamber and a second modular unit having said substrate transport mechanism.~~

4. (Previously Amended) The semiconductor manufacturing apparatus according to Claim 1, further comprising a plasma generation mechanism for generating plasma in said processing chamber.

5. (Previously Amended) The semiconductor manufacturing apparatus according to Claim 4, wherein said plasma generation mechanism radiates microwave energy through a slot antenna.

6. (Original) The semiconductor manufacturing apparatus according to Claim 4, wherein a plurality of cylindrical permanent magnets are disposed substantially on the circumference surrounding the substrate in the atmosphere outside said vacuum vessel, in order to impress magnetic field around said substrate.

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7. (Original) The semiconductor manufacturing apparatus according to any one of Claims 1 to 6, wherein said substrate stage is provided with a means for impressing direct current or alternating current power.

8. (Currently Amended) The semiconductor manufacturing apparatus according to Claim 2, wherein said vacuum vessel ~~can be divided into a part including said processing chamber and a part having said substrate transport mechanism having a modular configuration, the modular configuration including a first modular unit having said processing chamber and a second modular unit having said substrate transport mechanism.~~

9. (Previously Amended) The semiconductor manufacturing apparatus according to Claim 2 comprising a plasma generation mechanism for generating plasma in said processing chamber.

10. (Currently Amended) The semiconductor manufacturing apparatus according to Claim 3 comprising a plasma generation mechanism for generating plasma in said processing chamber. ~~11. The semiconductor manufacturing apparatus according to Claim 10, wherein said plasma generation mechanism radiates microwave energy through a slot antenna.~~

11. (canceled)

12. (New) The semiconductor manufacturing apparatus according to Claim 1, wherein the immovable substrate receiving portion of said substrate stage defining an upper end of said substrate stage.

13. (New) The semiconductor manufacturing apparatus according to Claim 2, wherein the respective immovable substrate receiving portion of each substrate stage defining an upper end of said substrate stage associated therewith.